

to applicant to come forward with evidence establishing an unobvious difference between the claimed product the prior art product. However, the Examiner **has not provided any rationale** tending to show that the claimed product is the same or similar to the product of the Shaw et al. reference. Therefore, the burden has not shifted to Applicants to come forward with evidence establishing an unobvious difference between the claimed product and the Shaw et al. product.

Since claim 2 is dependent on claim 3, the foregoing comments are applicable to both these claims.

The rejection of claims 12-13 under 35 U.S.C. §103(a) as being unpatentable over Shaw et al. in view of Lashmore (US '431), as evidenced by Coll et al. (US '226) is respectfully traversed.

Since claims 12-13 are dependent on claims 2 and 3 as discussed above, the foregoing comments are also applicable to this rejection.

Furthermore, although Coll et al. disclose a method to grow carbon nanotubes on the surface of a Ni-Al nano-supported sponge catalyst, this reference does not disclose a method to grow carbon nanotubes on the surface of Ni_3Al . Please see page 3, paragraph 24 of Coll et al. The Ni-Al nano-supported sponge catalyst of Coll et al. does not comprise an intermetallic compound Ni_3Al , since the contents of Ni and Al of the Ni-Al nano-supported sponge catalyst are respectively 50 % and 50 %.

The Examiner applies the Lashmore et al. reference for its teaching that a catalyst particle may be embedded in a nanotube fiber. However, even if this reference were combined with Shaw et al. in the manner suggested by the Examiner, the result of this combination would still not suggest the subject matter of claims 12-13 for the reasons set forth above concerning the Shaw et al. reference.

The rejection of claims 15-16 under 35 U.S.C. §103(a) as being unpatentable over Shaw et al. in view of Makoto et al. (JP '753) as evidenced by Lessing (US '655) is respectfully traversed.

The comments set forth above concerning the Shaw et al. reference are equally applicable to this rejection since claims 15-16 are dependent on claims 2-3, respectively, which have been discussed above.

The Examiner asserts that Makoto et al. teach a catalyst for methanol reforming while Cu, Ni, and Al are to be used, and that the compound is alkali treated to obtain precipitates. Furthermore, the Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the alkali treatment of Makoto et al. with the compound of Shaw et al. in order to obtain precipitates.

However, the alkali treatment of Makoto et al. is different from that of the present invention. The alkali treatment of this reference is that an alkali is added to an aqueous solution of water-soluble compounds of Cu, Ni and Al to obtain precipitates, and the methanol reforming catalyst is produced by baking and reducing the precipitates. On the other hand, the alkali treatment of the present invention is that the intermetallic compound Ni_3Al is treated with an alkali or acid, for removal of the oxide on the surface of the intermetallic compound Ni_3Al , control of the surface shape and the composition, and enhancement of catalytic activity by dissolving Al and Ni (please see the third paragraph on page 6 of the present specification.).

Furthermore, although Lessing discloses a Ni_3Al catalyzing steam reforming of hydrocarbon, this reference fails to disclose or suggest an intermetallic compound Ni_3Al being used as a methanol-reforming catalyst. It is well known that catalysis among different chemical reactions is unpredictable in the chemical arts.

The rejection of claims 20-21, 5-6 and 12-13 under 35 U.S.C. §103(a) as being unpatentable over Shaw et al. in view of Takuya et al. (JP '402) as evidenced by Lessing is respectfully traversed.

The comments set forth above concerning the Shaw et al. and Lessing references are equally applicable to this rejection, it being noted that claims 12-13 and 20-21 are dependent on claims 2 and 3 which have been discussed above.

The Takuya et al. reference discloses a method for reforming methanol using a Ni-containing metal deposited on a metallic member into which Al is incorporated to form a catalyst on the surface.

At about the middle of page 6 of the Office Action, the Examiner states that Lessing teaches steam reforming of hydrocarbon fuels. However, as indicated above, catalysis among different chemical reactions is unpredictable in the chemical arts.

At the middle of page 7 of the Office Action, referring to Applicants' disclosure on pages 8-9, the Examiner states that it would have been obvious to grow carbon nanofibers as Lessing's reaction is a methanol reforming reaction utilizing a similar material and would thus produce a similar reactive product. However, referring to claim 5 (and claim 6 dependent thereon), the carbon nanofibers contain fine metal particles, which is not suggested by the Lessing et al. reference.

The rejection of claim 9 under 35 U.S.C. §103(a) as being unpatentable over Shaw et al. as modified by Takuya et al. as evidenced by Lessing et al. and further in view of Fukui et al. (US '439) is respectfully traversed.

The comments set forth above concerning the Shaw et al., Takuya et al. and Lessing et al. references are equally applicable to this rejection, it being noted that claim 9 is dependent on claim 21, which in turn is dependent on claim 3 discussed above. Therefore, even if the references were combined in the manner suggested by the Examiner, the result of such combination would still not suggest the subject matter of claim 9.

The rejection of claims 5-6 and 26 under 35 U.S.C. §103(a) as being unpatentable over Shaw et al. in view of Lashmore et al. as evidenced by Coll et al. is respectfully traversed.

The comments set forth above concerning all of these references are equally applicable to this rejection, it being noted that both claims 6 and 26 are dependent on claim 5 discussed above. Therefore, even if the references were combined in the manner suggested by the Examiner, the result of such combination would still not suggest the subject matter of these claims.

The rejection of claims 18-19 under 35 U.S.C. §103(a) as being unpatentable over Shaw et al. as modified by Lashmore et al. as evidenced by Coll et al. further in view of Makoto et al. is respectfully traversed.

The comments set forth above concerning all of these references are equally applicable to this rejection, it being noted that claims 18 and 19 are dependent on claims 5 and 6, respectively, discussed above.

The rejection of claims 23-24 under 35 U.S.C. §103(a) as being unpatentable over Shaw et al. as modified by Lashmore et al. as evidenced by Coll et al. further in view of Takuya et al. is respectfully traversed.

The comments set forth above concerning all of these references are equally applicable to this rejection, it being noted that claims 23 and 24 are dependent on claims 5 and 6, respectively.

The rejection of claim 27 under 35 U.S.C. §103(a) as being unpatentable over Shaw et al. as modified by Lashmore et al. as evidenced by Coll et al. further in view of Fukui et al. is respectfully traversed.


The comments set forth above concerning all of these references are equally applicable to this rejection, it being noted that claim 27 is dependent on claim 23, which in turn is dependent on claim 5.

Therefore, in view of the foregoing remarks, it is submitted that each of the grounds of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

The Commissioner is authorized to charge any deficiency or to credit any overpayment associated with this communication to Deposit Account No. 23-0975, with the EXCEPTION of deficiencies in fees for multiple dependent claims in new applications.

Respectfully submitted,

Ya XU et al.

By: 
Michael R. Davis
Registration No. 25,134
Attorney for Applicants

MRD/pth
Washington, D.C. 20005-1503
Telephone (202) 721-8200
Facsimile (202) 721-8250
August 3, 2009